ABSTRACTS OF PAPERS DELIVERED AT SECTION MEETINGS

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FRACTURE OF THE FIFTH METATARSAL BONE WITH SPECIAL REFERENCE TO DELAYED UNION

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Twenty-one cases of fracture of the fifth metatarsal bone will be considered to illustrate a tendency toward delayed union probably caused by poor blood supply. Knowledge of this tendency is necessary for prognosis and treatment.

In 1855 Breithaupt first described the condition known as "Fussgeschwulst." He noted that soldiers on the march were frequently disabled by painful, swollen and tender feet, and he attributed this condition to strained ligaments and tendons. Subsequently the condition was described under various other names, but in 1898 Kirchner first showed it to be a fracture by roentgenogram. There have been occasional references in the literature to slow formation of callus in some fractured metatarsals. Delayed union in some fractures of the fifth metatarsal could easily explain the picture presented in "Fussgeschwulst."

The fifth metatarsal bone consists of the base, tuberosity, shaft and head. It must be remembered that the tuberosity has a separate epiphysis which makes its appearance at about the twelfth year and is completely ossified at about the sixteenth. The muscle and ligamentous attachments to the base and the shaft play an important rôle in the production of fracture by indirect violence. The nutrient vessel of the fifth metatarsal is very small and is represented only by a few fine branches which anastomose with the small blood-vessels of the epiphyses.

The usual mechanism of fracture of this bone is by indirect violence, while its exposed position is a predisposing factor for its injury by direct violence.

An analysis of twenty-one cases from the Presbyterian Hospital given in the table shows the following:

1. Sex { Males 9 (47%); Females 12 (53%)

2. Age { Youngest 13 years; Oldest 60 years; Average 36 years

		Base	Tuberosity	Shaft	Distal extremity	Total
3. Violence	Direct	3 (38%)	1 (12%)	2 (25%)	2 (25%)	8
	Indirect	7 (64%)	2 (18%)	1 (9%)	1 (9%)	11
	Doubtful	2 (100%)				2

4. Predominant symptoms and signs—pain, swelling, ecchymosis and tenderness.

5. Length Disability (16 cases) { Shortest 2 weeks; Longest 24 weeks; Average 10 weeks

6. Females tend to have a longer disability than males.
7. The end results are good.

A further analysis of the twenty cases in adults shows that there were five cases which from clinical and X-ray evidence had delayed union. This occurred four times at the base and once at the distal extremity of the shaft. All the other cases that could be followed had characteristic pain, tenderness and edema at and surrounding the area of fracture, which extended over periods of weeks or months. While it is true that soft part injury in association with the fracture might produce these symptoms for a short period, still interference with proper bony union is the most plausible explanation for the long disability.

One would expect in a long bone as small as the fifth metatarsal that enough union would take place in the cancellous portions in about ten days to prevent mobility of the fragments. In the cortical bone of the shaft normal calcification should occur in about three weeks. The callus may be scarcely visible in the X-ray, it may be excessive, or it may be long and thin. It must be remembered, however, that the time for the appearance of callus in the X-ray is variable.

The treatment recommended for fracture of the fifth metatarsal is immobilization of the foot and leg by means of a posterior moulded plaster splint, which will permit physiotherapy. If there is a tendency to delayed union, the administration of cal-

cium or cod liver oil is recommended. Scarification of the fractured end with a needle introduced through the soft parts in order to produce bleeding may be tried. Excessive trauma to demonstrate mobility of the fragments is to be avoided.

Summary

Twenty-one cases of fracture of the fifth metatarsal are reported, with their analysis. Twenty were in adults, and of these five showed clinical and X-ray evidence of delayed union. All the latter had a normal blood calcium and phosphorous and a negative urine and blood Wassermann. All the other cases that could be followed had clinical symptoms over such long periods that it is fair to assume some interference in bone repair. The main cause of this condition is probably the poor blood supply of this bone. The treatment is directed toward immediate immobilization and hyperemia. The experience from all these cases tends to show that too long immobilization produces bone atrophy which certainly cannot help bone repair. Weight bearing in a strong moulded plaster splint before one month, where possible, is suggested to overcome this bone atrophy. Between the 11th and 16th years, the epiphysis of the tuberosity is not to be mistaken for fracture.

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THE CULTIVATION OF LENS EPITHELIUM*

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It was proposed by Dr. John M. Wheeler that an original investigation be conducted into the nature of the cause of senile cataract and the possibility of its prevention and arrest by non-surgical means.

It was decided to approach the problem from a scientific rather than an empiric standpoint and to go back to fundamentals. A study of the developing lens in the living embryo and of the

* The reader is referred to the complete article in *Transactions* of the American Academy of Ophthalmology and Oto-Larnygology, 1926, page 136.